Device/User Interface Software Requirements For Krohn-Hite 3905B Programmable Filter

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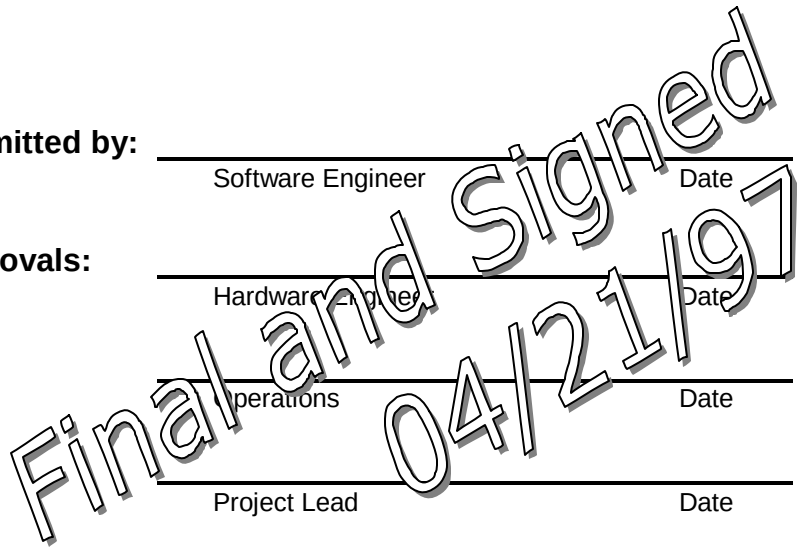

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1.0 Introduction

This document provides device and user interface requirements for the Krohn-Hite 3905B Programmable Filter.

2.0 Required Functionality

The Krohnhite Model 3905 mainframe with Model 34A and Model 35/36 plug-in filters provide two tunable filters. The primary use of these tunable filters is to remove unwanted sidebands from the PCM signal before it modulates either the test inject signal generator or the uplink exciter. All of the functions of the tunable filter (channel, mode, frequency, gain, coupling, etc.) are required to set the desired operation. The two tunable filters are controlled and monitored by the Tracking & Command node computer. The input of the Model 34A filter is permanently cabled to the Uplink Control Unit output so that it can only be used for filtering uplink command signals. The output of the Model 34A is an input to the Test & Command Switch Matrix so either its output or the output of the Model 35/36 can be switched to the input of the Fiber Optic modem which provides the input to the test inject signal generator or the uplink exciter in the antenna pedestal. The input to the Model 35/36 filter is selectable via the Test & Command Matrix to permit a wide range of test signal inputs from the PCM simulator, Bit Error Rate Test Set, PTP, etc.

3.0 Parameter Ranges

The SGS/AGS requirments do not differ from the device capabilities for the Krohn-Hite 3905B Programmable Filter. Parameter ranges will be fully utilized. Refer to the Model 34A and the Model 35/36 plug-in filter module manuals for the device capabilities..

4.0 Communications Protocol

The signals are carried by RS-232 protocol that enter the Krohn-Hite 3905B Programmable Filter through an IO Tech IEEE 488 Converter. The returned signal passes through the IO Tech IEEE 488 converter to be output on a RS-232 bus.

5.0 GUI Functionality

See Appendix A: Graphical User Interface Requirements

6.0 Command Scripting

See Appendix B: Scripting Requirements

7.0 High-level Status

High level status will be determined by the pass or fail result of the data flow test.

8.0 Replacement Algorithm

There is no replacement algorithm as such. The master will schedule Krohn-Hite’s on a least used basis. If a Krohn-Hite fails, it will be replaced.

Appendix A: Graphical User Interface Requirements

The user will be able to access the following remote controllable features.

Requirement: The user will be able to access the following remote controllable features required to operate a Model 3905B Programmable Filter Mainframe. The following inputs will be available to the user:

Filter Type:
- 1 = Butterworth
- 2 = Bessel
- default = Butterworth

Cutoff Frequency:
- set frequency in Hertz or Kilohertz
- default = 100kHz (Model 34A)
- default = 1mHz (Model 35/36)

Input Gain:
- set input gain
- increase/decrease input gain
- default = 0dB

Output Gain:
- set output gain
- increase/decrease output gain
- default = 0dB (Model 34A)
- default = 6dB (Model 35/36)

Channel:
- set channel
- select next/previous channel

Type Termination:
- set input terminator
  - off (unterminated)
  - #1 on (terminated)
  - #2 on (terminated)
  - #3 on (terminated)

Mode:
For the 34A filter the modes are:
- low-pass

- high-pass
- band-pass
- band-reject
- band by-pass
- default = low pass

For the 35/36 filter the modes are:

- low pass
- amplifier by-pass
- default = low pass

Coupling:

- ac or dc coupled
- default = ac (Model 34A)
- default = dc (Model 35/36)

All Channel:

- set all channel mode or NOT channel mode

Other:

- send overflow status
- report board number
- GPIB service request on/off
- report model number and software version

Appendix B: Scripting Requirements

Tracking and Command Node
3905B Digital Low Pass Filter

Master	Node	Comments/Error Handling

Resource Request Specific
- low pass filter number
	Start
	
	Check allocation table for low pass filter number
	
	If available then
	Mark unit as assigned to this Master
	Reply “Unit # assigned”
	Open log file
	Retrieve configuration file from this Master
	Else
	Reply “Unit # not available”
	End
	
	Stop	

Resource Request General	Start
	
	Check allocation table for an available filter using the least recently used method
	
	If available then
	Mark unit as assigned to this Master
	Reply “Unit # assigned”
	Open log file
	Retrieve configuration file from this Master
	Else
	Reply “No units available”
	End	

Master	Node	Comments/Error Handling
	Stop	

Setup
Parameter: low pass filter number
	Start
	
	Verify possession of filter by this Master
	
	If not assigned to this Master then
	Inform this Master
	Stop
	End
	
	Load and Verify configuration file
	
	If configuration file error then
	Inform this Master
	Stop
	End
	
	Stop
		>> Operator intervention required
		
		>> Operator intervention required

Start Support Parameter: low pass filter number	Start Verify possession of filter by this Master If not assigned to this Master then Inform this Master Stop End Stop	>> Operator intervention required
Stop Support Parameter: low pass filter number	Start Verify possession of filter by this Master If not assigned to this Master then Inform this Master Stop End	>> Operator intervention required

Master	Node	Comments/Error Handling
	Stop	
Takedown Parameter: low pass filter number	Start Verify possession of filter by this Master If not assigned to this Master then Inform this Master Stop End Mark filter as not assigned Close log file Send log file to this Master Stop	>> Operator intervention required